

**WHAT IS CLAIMED IS:**

1. A method of retransmitting a GPS signal inside a structure, the method comprising:

- receiving the GPS signal;
- 5 amplifying the GPS signal to produce a second GPS signal; and
- retransmitting the second GPS signal inside the structure.

2. The method of claim 1, wherein the amplifying of the GPS signal includes down converting the GPS signal to an intermediate frequency (IF) signal, amplifying and filtering the IF signal, and up converting the IF signal to produce a 10 radio frequency (RF) signal.

3. The method of claim 2, wherein the RF signal is the second GPS signal.

4. The method of claim 2, wherein the RF signal is an unlicensed frequency signal.

5. The method of claim 4, further including:

- 15 retransmitting the unlicensed frequency signal inside the structure;
- receiving the unlicensed frequency signal;
- down converting the unlicensed frequency signal to a second IF signal;
- amplifying the second IF signal;
- up converting the second IF signal to produce the second GPS signal.

20 6. The method of claim 1, further including filtering the GPS signal.

7. A method of retransmitting a GPS signal inside a structure, the method comprising:

- receiving the GPS signal;
- 25 down converting the GPS signal to an intermediate frequency (IF) signal;
- amplifying and filtering the IF signal;
- up converting the IF signal to an unlicensed frequency signal; and
- retransmitting the unlicensed frequency signal to a link antenna inside the structure.

8. The method of claim 7, wherein the retransmitting the unlicensed frequency signal is between a primary repeater and the link antenna of a secondary repeater.

9. The method of claim 7, further including:  
5 receiving the unlicensed frequency signal;  
down converting the unlicensed frequency signal to a second IF signal;  
amplifying the second IF signal;  
up converting the second IF signal to a second GPS signal; and  
retransmitting the second GPS signal inside the structure.

10. A method of retransmitting a GPS signal inside a structure, the method comprising:

receiving the GPS signal;  
down converting the GPS signal to an intermediate frequency (IF) signal;  
amplifying the IF signal; and  
15 up converting the IF signal to a second GPS signal; and  
retransmitting the second GPS signal inside the structure.

11. The method of claim 10, wherein the receiving is performed by a primary repeater.

12. The method of claim 11, wherein the primary repeater is coupled to an 20 internal antenna by a transmission line.

13. The method of claim 12, wherein the internal antenna performs the retransmitting.

14. A method of retransmitting a GPS signal inside a structure, the method comprising:

25 receiving the GPS signal;  
down converting the GPS signal to an intermediate frequency (IF) signal;  
amplifying the IF signal;  
up converting the IF signal to an unlicensed frequency signal;  
retransmitting the unlicensed frequency signal to a link antenna inside the  
30 structure;

receiving the unlicensed frequency signal;  
down converting the unlicensed frequency signal to a second IF signal;  
amplifying the second IF signal;  
up converting the second IF signal to a second GPS signal; and  
retransmitting the second GPS signal inside the structure.

5 15. The method of claim 14, wherein the retransmitting the unlicensed frequency signal is between a primary repeater and the link antenna of a secondary repeater.

10 16. A GPS repeater for retransmitting a GPS signal inside a structure, the repeater comprising:

a link antenna for receiving the GPS signal;  
an amplifier for amplifying the GPS signal to produce a second GPS signal; and  
a broadcast antenna for retransmitting the second GPS signal inside the structure.

15 17. The repeater of claim 16, wherein the amplifier down converts the GPS signal to an intermediate frequency (IF) signal, amplifies and filters the IF signal, and up converts the IF signal to produce a radio frequency (RF) signal.

18. The repeater of claim 17, wherein the RF signal is the second GPS signal.

20 19. The repeater of claim 17, wherein the RF signal is an unlicensed frequency signal.

25 20. The repeater of claim 19, further including a broadcast antenna for retransmitting the unlicensed frequency signal inside the structure, and a secondary repeater for receiving the unlicensed frequency signal, down converting the unlicensed frequency signal to a second IF signal, amplifying and filtering the second IF signal, and up converting the second IF signal to produce the second GPS signal.

21. The repeater of claim 16, wherein the amplifier includes a down converter for down converting the GPS signal to an intermediate frequency (IF) signal, a first amplifier for amplifying the IF signal, a filter for filtering the IF signal, a second

amplifier for amplifying the IF signal and an up converter for up converting the IF signal to produce the second GPS signal.

22. The repeater of claim 16, wherein the amplifier includes a filter for filtering the GPS signal.

5 23. A GPS repeater system for retransmitting a GPS signal inside a structure, the repeater system comprising:

a primary repeater having a link antenna for receiving the GPS signal, a down converter for down converting the GPS signal to an intermediate frequency (IF) signal, an amplifier for amplifying the IF signal, an up converter for up converting the IF 10 signal to a radio frequency (RF) signal, and a broadcast antenna for retransmitting the RF signal inside the structure.

24. The system of claim 23, wherein the RF signal is a GPS signal.

25. The system of claim 23, wherein the RF signal is an unlicensed frequency signal.

15 26. The system of claim 25, further including a secondary repeater having a second link antenna for receiving the unlicensed frequency signal, a second down converter for down converting the unlicensed frequency signal to a second IF signal, a second amplifier for amplifying the second IF signal, a second up converter for up converting the second IF signal to a second GPS signal, and a second broadcast 20 antenna for retransmitting the second GPS signal inside the structure.

27. A GPS repeater for retransmitting a GPS signal inside a structure, the repeater comprising:

a link antenna for receiving the GPS signal;  
a down converter for down converting the GPS signal to an intermediate 25 frequency (IF) signal;  
an amplifier for amplifying the IF signal; and  
an up converter for up converting the IF signal to a second GPS signal; and  
a broadcast antenna for retransmitting the second GPS signal inside the structure.

28. The repeater of claim 27, further including a housing containing the down zconverter, the amplifier and the up converter, the link antenna being connected to the housing by a transmission line.

29. The repeater of claim 28, wherein the broadcast antenna is connected to 5 the housing by a transmission line.

30. The repeater of claim 27, wherein the amplifier includes a filter for filtering the IF signal.

31. A GPS repeater system for retransmitting a GPS signal inside a structure, the repeater system comprising:

10 a primary repeater having a link antenna for receiving the GPS signal, a down converter for down converting the GPS signal to an intermediate frequency (IF) signal, an amplifier for amplifying the IF signal, an up converter for up converting the IF signal to an unlicensed frequency signal, and a broadcast antenna for retransmitting the unlicensed frequency signal, inside the structure, to a secondary repeater;

15 the secondary repeater having a second link antenna for receiving the unlicensed frequency signal, a second down converter for down converting the unlicensed frequency signal to a second IF signal, a second amplifier for amplifying the second IF signal, a second up converter for up converting the second IF signal to a second GPS signal, and a second broadcast antenna for retransmitting the second GPS 20 signal inside the structure.

32. The system of claim 31, wherein the unlicensed frequency signal is about 2.4 GHz.

33. The system of claim 31, wherein the unlicensed frequency signal is about 902-928 MHz.

25 34. The system of claim 31, wherein the GPS signal is about 1.5 GHz.

35. The system of claim 31, wherein the IF signal is about 140-160 MHz.

36. A method of retransmitting a satellite signal inside a structure, the method comprising:

receiving the satellite signal;

30 amplifying the satellite signal to produce a second satellite signal; and

retransmitting the second satellite signal inside the structure.

37. The method of claim 36, wherein the amplifying of the satellite signal includes down converting the satellite signal to an intermediate frequency (IF) signal, amplifying and filtering the IF signal, and up converting the IF signal to produce a  
5 radio frequency (RF) signal.

38. The method of claim 37, wherein the RF signal is the second satellite signal.

39. The method of claim 37, wherein the RF signal is an unlicensed frequency signal.

10 40. The method of claim 39, further including:  
retransmitting the unlicensed frequency signal inside the structure;  
receiving the unlicensed frequency signal;  
down converting the unlicensed frequency signal to a second IF signal;  
amplifying the second IF signal;  
15 up converting the second IF signal to produce the second satellite signal.

41. The method of claim 36, wherein the satellite signal is a digital radio signal.

42. A repeater for retransmitting a satellite signal inside a structure, the repeater comprising:

20 a link antenna for receiving the satellite signal;  
an amplifier for amplifying the satellite signal to produce a second satellite signal; and  
a broadcast antenna for retransmitting the second satellite signal inside the structure.

25 43. The repeater of claim 42, wherein the amplifier down converts the satellite signal to an intermediate frequency (IF) signal, amplifies and filters the IF signal, and up converts the IF signal to produce a radio frequency (RF) signal.

44. The repeater of claim 43, wherein the RF signal is the second satellite signal.

45. The repeater of claim 43, wherein the RF signal is an unlicensed frequency signal.

46. The repeater of claim 45, further including a broadcast antenna for retransmitting the unlicensed frequency signal inside the structure, and a secondary 5 repeater for receiving the unlicensed frequency signal, down converting the unlicensed frequency signal to a second IF signal, amplifying and filtering the second IF signal, and up converting the second IF signal to produce the second satellite signal.

47. The repeater of claim 42, wherein the satellite signal is a digital radio signal.